

What is claimed:

1. A latex paint composition comprising:

(a) a polymer having interpolymerized units that comprise units derived from styrene, methyl styrene, vinyl, or combinations thereof and units derived from one or more acrylates, methacrylates, acrylonitrile, or combinations thereof,

(b) hiding pigment,

(c) non-cellulosic thickener, and

(d) at least about 0.01 weight per volume percent fluorochemical acrylic polymer additive comprising: (1) at least one perfluoroalkyl moiety selected from the group consisting of heptafluoropropanesulfonamido, nonafluorobutanesulfonamido, undecafluoropentanesulfonamido, and tridecafluorohexanesulfonamido moieties, (2) at least one polyoxyalkylene block comprising at least one (a) alkyleneoxy moiety or (b) alkylene group interrupted by a carboxyester moiety, and (3) at least one water solubilizing polar group;

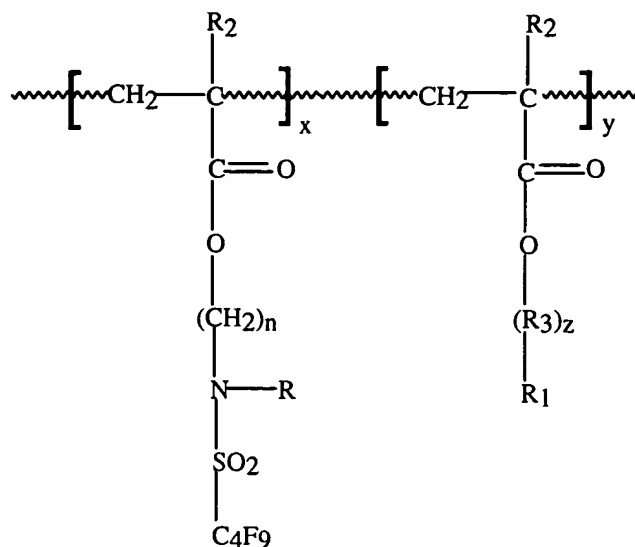
wherein said fluorochemical acrylic polymer additive comprises about 5 to about 30 weight percent carbon-bonded fluorine based upon the total weight of said fluorochemical acrylic polymer, and said latex paint composition has a pigment volume concentration of at least 20% and equal to or greater than its critical pigment volume concentration.

2. The paint composition of claim 1 wherein said perfluoroalkyl moiety is nonafluorobutanesulfonamido.

3. The paint composition of claim 1 wherein a plurality of said perfluoroalkyl moieties are each linked to at least one said polyoxyalkylene block by a polymeric chain.

4. The paint composition of claim 1 wherein said alkyleneoxy moiety is selected from the group consisting of ethyleneoxy moieties and propyleneoxy moieties.

5. The paint composition of claim 1 wherein said fluorochemical acrylic polymer additive is selected from those represented by the following general formula:

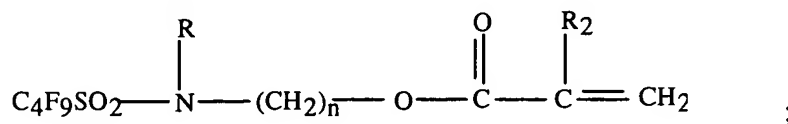


wherein:

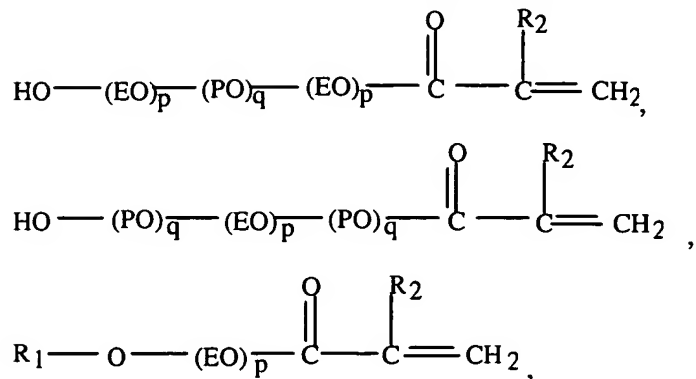
- 5                     $\text{---}$  represents a bond in a polymerizable or polymer chain;
- R, R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen or alkyl of 1 to 4 carbon atoms;
- R<sub>3</sub> is at least one or more straight or branched alkyleneoxy groups, linked together and having 2 to 6 carbon atoms, or a straight or branched alkylene group having 12 to 20 carbon atoms;
- 10                  n is an integer from 2 to 10; and
- x, y and z are integers of at least 1.

6. The paint composition of claim 1 wherein said fluorochemical acrylic polymer additive comprises the reaction product of:

- 15                  (i) a compound represented by the following general formula:

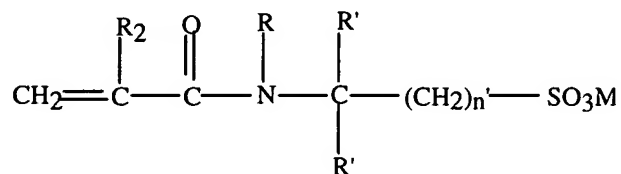


(ii) a compound selected from the group consisting of



5 and mixtures thereof; and

(iii) a compound represented by the following general formula:

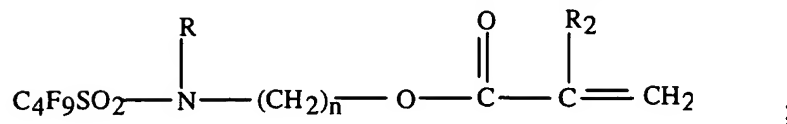


wherein:

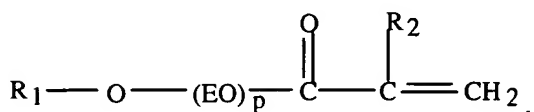
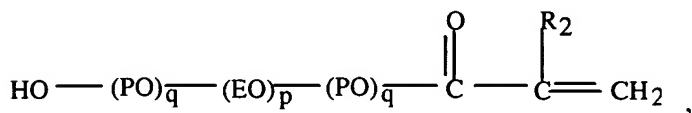
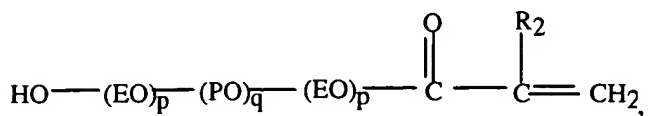
- 10 R, R<sub>1</sub>, R<sub>2</sub>, R' are hydrogen or alkyl of 1 to 4 carbon atoms,  
 n is an integer of 2 to about 10,  
 EO is an ethyleneoxy moiety,  
 PO is a propyleneoxy moiety,  
 p is an integer of 1 to about 130,  
 15 q is an integer of 0 to about 55,  
 n' is an integer of 1 to about 10, and  
 M is hydrogen or a cation.

20 7. The paint composition of claim 1 wherein said fluorochemical acrylic polymer additive comprises the reaction product of:

(i) a compound represented by the following general formula:

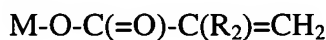


(ii) a compound selected from the group consisting of



and mixtures thereof; and

(iii) a compound represented by the following general formula:



wherein:

R, R<sub>1</sub>, R<sub>2</sub>, and R' are independently hydrogen or alkyl of 1 to 4 carbons atoms,

n is an integer of 2 to about 10,

EO is an ethyleneoxy moiety,

PO is a propyleneoxy moiety,

p is an integer of 1 to about 130,

q is an integer of 0 to about 55, and

M is H, potassium, sodium, ammonium, or protonated tertiary amine.

8. The paint composition of claim 1 wherein said interpolymerized units comprise at least 40 mole percent of units derived from styrene, methyl styrene, or combinations thereof and at least 10 mole percent of units derived from one or more acrylates, methacrylates, acrylonitrile, or combinations thereof.

9. The paint composition of claim 1 wherein said polymer has a glass-transition temperature between 21°C and 95°C.

10. The paint composition of claim 1 wherein said hiding pigment has an index of refraction above about 1.8.

11. The paint composition of claim 1 wherein thickener is an associative thickener.

12. The paint composition of claim 1 wherein said latex paint further comprises a calcium carbonate functional extender.

13. The paint composition of claim 1 wherein said latex paint further comprises a coalescing solvent.

14. An article wherein a portion of at least one surface of said article is coated with the paint composition of claim 1.

15. A method of imparting stain and soil resistance to a latex paint coating comprising the steps of:

(a) providing a latex paint composition comprising (1) a polymer having interpolymerized units that comprise units derived from styrene, methyl styrene, vinyl, or combinations thereof and units derived from one or more acrylates, methacrylates, acrylonitrile, or combinations thereof, (2) hiding pigment, and (3) non-cellulosic thickener; wherein said latex paint has a pigment volume concentration of at least 20% and equal to or greater than its critical pigment volume concentration;

(b) adding at least about 0.01 weight per volume percent of a fluorochemical acrylic polymer additive comprising: (1) at least one perfluoroalkyl moiety selected from the group consisting of heptafluoropropanesulfonamido, nonafluorobutanesulfonamido, undecafluoropentanesulfonamido, and tridecafluorohexanesulfonamido moieties, (2) at least

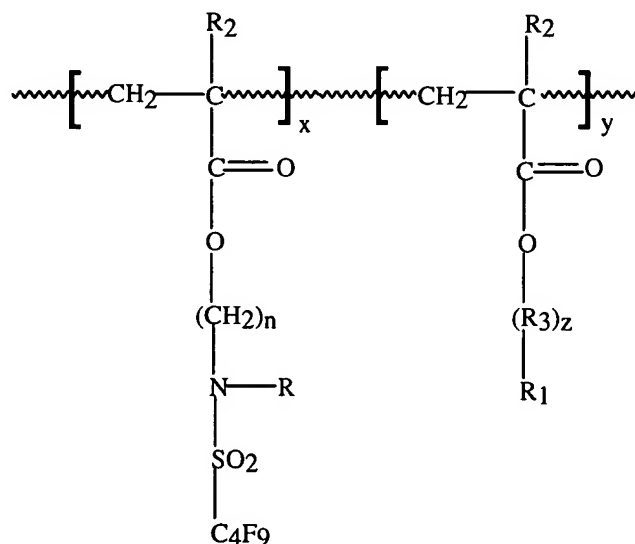
one polyoxyalkylene block comprising at least one (a) alkyleneoxy moiety or (b) alkylene group interrupted by a carboxyester moiety, and (3) at least one water-solubilizing polar group; wherein said fluorochemical acrylic polymer has about 5 to about 30 weight percent carbon-bonded fluorine based upon the total weight of said fluorochemical acrylic polymer to said latex paint composition;

(c) applying the resulting composition of (b) to a substrate surface; and

(d) allowing said resulting composition to dry such that a coating with a fluorine-enriched surface is formed on said substrate surface.

16. The method of claim 15 wherein said polymer has a glass-transition temperature between 21°C and 95°C.

17. The method of claim 15 wherein said fluorochemical acrylic polymer additive is selected from those represented by the following general formula:



wherein:

~~~~~ represents a bond in a polymerizable or polymer chain;

R, R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen or alkyl of 1 to 4 carbon atoms;

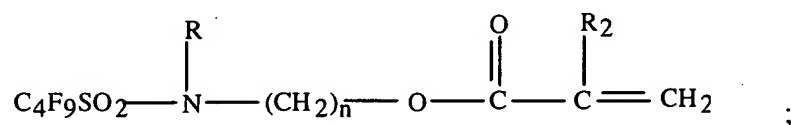
$R_3$  is at least one or more straight or branched alkylene-oxy groups, linked together and having 2 to 6 carbon atoms, or a straight or branched alkylene group having 12 to 20 carbon atoms;

$n$  is an integer from 2 to 10; and

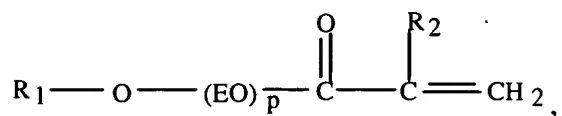
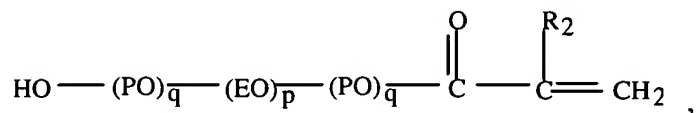
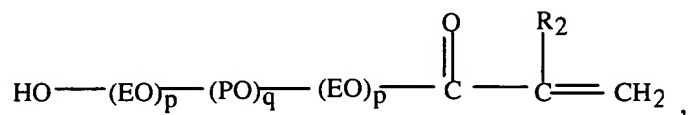
$x$ ,  $y$  and  $z$  are integers of at least 1.

18. The method of claim 15 wherein said fluorochemical acrylic polymer additive comprises the reaction product of:

(i) a compound represented by the following general formula:

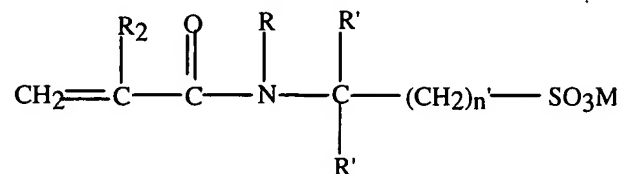


(ii) a compound selected from the group consisting of



and mixtures thereof; and

(iii) a compound represented by the following general formula:



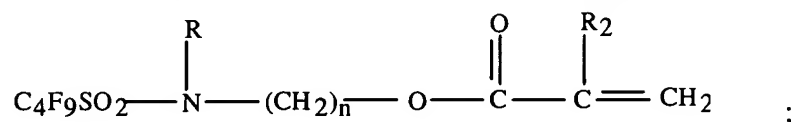
wherein:

$R$ ,  $R_1$ ,  $R_2$ ,  $R'$  are hydrogen or alkyl of 1 to 4 carbon atoms,

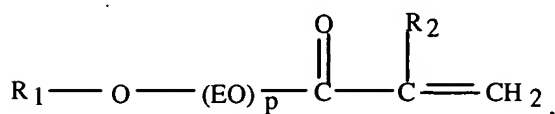
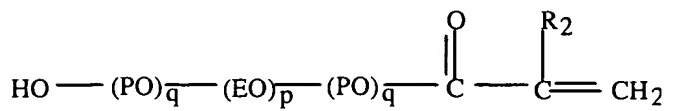
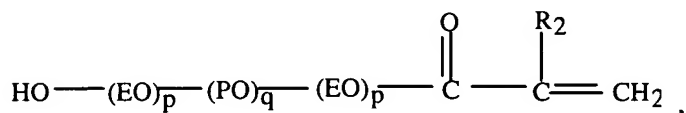
n is an integer of 2 to about 10,  
 EO is an ethyleneoxy moiety,  
 PO is a propyleneoxy moiety,  
 p is an integer of 1 to about 128,  
 q is an integer of 0 to about 55, and  
 n' is an integer of 1 to about 10.

19. The method of claim 15 wherein said fluorochemical acrylic polymer additive comprises the reaction product of:

(i) a compound represented by the following general formula:

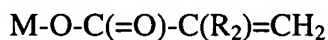


(ii) a compound selected from the group consisting of



and mixtures thereof; and

(iii) a compound represented by the following general formula:



wherein:

R, R<sub>1</sub>, R<sub>2</sub>, and R' are independently hydrogen or alkyl of 1 to 4 carbons atoms,  
 n is an integer of 2 to about 10,  
 EO is an ethyleneoxy moiety,



PO is a propyleneoxy moiety,  
p is an integer of 1 to about 130,  
q is an integer of 0 to about 55, and  
M is H, potassium, sodium, ammonium, or protonated tertiary amine.